

# **ACTS Operations Extended Through a University-Based Consortium**

The Advanced Communications Technology Satellite (ACTS) program was slated for decommissioning in October 2000. With plans in place to move the spacecraft to an orbital graveyard and then shut the system down, NASA was challenged to consider the feasibility of extending operations for education and research purposes provided that an academic organization would be willing to cover operations costs. This was determined to be viable, and in the fall of 2000, NASA announced that it would consider extending operations.

On March 19, 2001, NASA, the Ohio Board of Regents, and the Ohio University signed a Space Act Agreement to continue ACTS operations for 2 more years with options to extend operations up to a total of 4 years. To accomplish this, the Ohio University has formed a university-based consortium, the Ohio Consortium for Advanced Communications Technology (OCACT), and acts as the managing member. The Ohio University is responsible for the full reimbursement of NASA's operations costs, and does this through consortium membership. NASA retains the operating license of the spacecraft and has two contractors supporting spacecraft and master control station operations.

This flexible arrangement between NASA and academia allows the education community to access a large communications satellite for learning about spacecraft operations and to use the system's transponders for communications applications. It also allows other organizations, such as commercial companies, to become consortium members and use the ACTS wideband Ka-band (30/20 GHz) payload. From the consortium members, six areas of interest have been identified.



*Advanced Communications Technology Satellite (ACTS).*

1. Space education: Use ACTS as a "laboratory" to educate students in subjects such as orbital mechanics, spacecraft control systems, spacecraft operations, radiofrequency engineering, ground station deployment and operations, and network management.
2. Educational content: Deliver educational content (e.g., from remote locations) to students in kindergarten through 12th grade, in collaboration with established educational content providers and foundations.
3. Engineering verifications: Use ACTS to characterize the performance of new Ka-band hardware components and verify their designs.
4. Final ground-station testing: Use ACTS for final preproduction testing of commercial-grade Ka-band ground stations designed and built by consortium members. These stations will be used with future Ka-band satellites.
5. Proof-of-concept demonstrations: Demonstrate telemedicine, satellite telephony, satellite-based Internet access, and other similar applications to promote the use of Ka-band services in the future.
6. Extended field and marketing trials: Offer and verify precommercial service in the

form of extended field trials.

Extending ACTS operations by transitioning them to a university consortium provides an excellent closing chapter on ACTS. The payload continues to operate on primary systems and can continue to be a learning tool for academia while providing the only operational Ka-band system in the Western Hemisphere.

**Find out more about this research:**

ACTS <http://acts.grc.nasa.gov/>

Ohio Consortium for Advanced Communications Technology

<http://www.csm.ohiou.edu/ocact/>

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**Programs/Projects:** Communications Technology

**Special recognition:** ACTS was inducted into the Space Technology Hall of Fame in April 1997 for its contributions to the commercialization of space technology, was given a 1995 R&D 100 Award in the Significant Technology Category, and was given the prestigious Federal Technology Leadership Award in 1995.